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*JP-A 57099729; JP-A 56167580; JP-A 81167580*

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PATENT ABSTRACTS OF JAPAN

**57099729**

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MANUFACTURE OF SEMI-AMORPHOUS SEMICONDUCTOR

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**APPL-NO:** 56167580 (JP 81167580)

**FILED:** October 20, 1981

**ASSIGNEE:** YAMAZAKI SHUNPEI

**INT-CL:** H01L21/205, (Section H, Class 01, Sub-class L, Group 21, Sub-group 205); //  
H01L31/04, (Section H, Class 01, Sub-class L, Group 31, Sub-group 04)

**REF-CITED:** 55026388

**ABST:**

**PURPOSE:** To perform transformation into a semiconductor material of semi- amorphous structure suitable for a photoelectric conversion device by a method wherein through irradiation on an amorphous semiconductor by an instantaneous light or a laser light, heating to reach a temperature that is lower than a melting temperature by a specified value is performed.

**CONSTITUTION:** For example by glow discharge at a low temperature (normal temperature W300 [degrees] C) using SiH<sub>4</sub> (He based) as reaction gas, an Si film of an amorphous (AS) structure is built on a clean substrate. The AS film is annealed by plasma at the temperature of 400W600 [degrees] C that is below a crystallizing temperature in hydrogen or He, and it is changed into a semi-amorphous (SAS) structure which has an intermediate crystal structure between an AS and a crystal and is stabilized by neutralizing an unpaired bond. During this annealing process, simultaneous radiation of an instantaneous light from an Xe lamp or a laser light is performed, under a temperature lower than a melting point by 100 [degrees] C or more during the irradiation. By this method, an SAS structure can be more stabilized.

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